



Oregon Wood Innovation Center

Connecting people, ideas, resources

COMING OWIC EVENTS:

- Oct 5: [PWLA Innovation Summit](#), Corvallis, OR
- Oct 16: [Basic Lumber Manufacturing and QC Workshop](#), Portland, OR
- Nov 19-20: [Quality Control in Wood Products Manufacturing Workshop](#), Corvallis, OR
- [Wood-Based Composite Science Short Course Series](#), Online

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WHAT'S NEW?:

Read the new [OWIC Executive Innovation Brief](#)

What If? Part 2

The lead article titled 'What If?' in the last edition of our newsletter generated quite a buzz from readers. For example, Bill Powell with States Industries in Eugene sent us a couple items addressing one of the themes in that article – 3D printing. Turns out, there are a couple firms going down this path. For example, Ponoko in New Zealand offers an online 3D printing service as well as an online CNC routing service. As the company states on its website, "We're reinventing the future of products by making it easier to make things." Their system works by having users upload product designs, choose materials, receive a quote, and then Ponoko

makes and delivers the products.

Take a look at the case example for how the machining version of the process works with a piece of furniture at <http://www.ponoko.com/make-and-sell/making-3D>. The process begins with a design - several software packages

printing. The list of materials currently available includes plastic, ceramic, and stainless steel (<http://www.ponoko.com/make-and-sell/materials>). Perhaps a cellulosic material like wood is just around the corner – What if?

Also, with regards to 3D printing – What if we could

'print' a complete house (or an entire neighborhood)? See USC professor Behrokh Khoshnevis' presentation on Contour Crafting: Automated Construction at <http://>



Source: <http://www.contourcrafting.org/>

for creating 3D designs are provided. The various required parts are drawn in one of the available templates. Once the design files are uploaded, the machined parts are created and mailed to the designer for assembly. Of course, some of the materials for the furniture could be produced via 3D

www.youtube.com/watch?feature=player_embedded&v=JdbJP8Gxqog#!. The process he describes is for cementaceous materials. He envisions building ('printing') a custom-designed 2500 ft² house in about 20 hours. The image to the left shows a model where the overhead crane is

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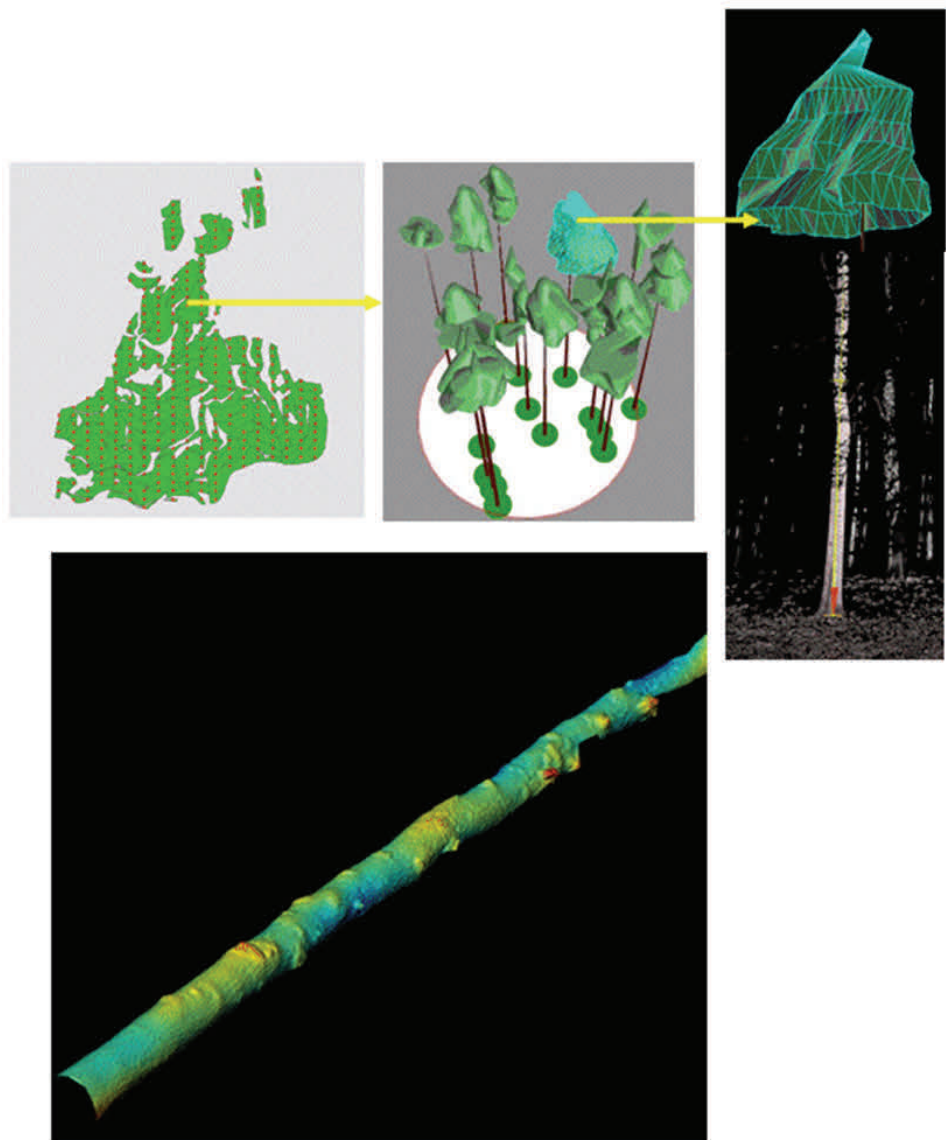
applying the wall material one layer at a time. For those of us with interest in renewable materials, what if we could develop a lignocellulosic material from wood-fiber that could be applied rather than the cementaceous material?

And in keeping with this 'What if?' theme, here's another concept for you to ponder that's a bit earlier in the wood products value chain. What if we could use lasers to scan trees from the air and/or from the ground to create detailed maps of the trees such as GPS locations of each tree, information on species and even log quality (based on size and location of limbs and other visible indicators of quality) for individual stems? And with an online database containing this information, we could direct mechanized harvesters to precise locations in the forest to harvest the right log for the right end product?

Like the 3D printing examples, this most certainly sounds like science fiction; and at this point in time, perhaps it is – although it is not as far from reality as it may seem. There is a 3-year project wrapping-up in Europe known as Flexwood (<http://www.flexwood-eu.org/>) that, among other things, has focused on addressing the various pieces of this puzzle just described. For example, the images to the right show the results of processed aerial- and ground-based LIDAR (light

detection and ranging) data for several trees as well as an individual tree stem. Individual tree data can be used to identify locations of knots and other features and thereby determine the yield of lumber by specific grades from each merchantable portion of a tree. Theoretically, as a sawmill manager, you could know the potential yield of lumber by species, size and grade, when bidding on a specific timber sale. Or

what if we think about it the other way round - knowing exactly what type of logs you need for the product to be produced you could query the database to find out where these trees are located, eventually including purchase and harvest conditions or the likes – a true 'forest warehouse'?



Source: Flexwood researchers Martin Opferkuch et al., University of Freiburg; from presentations given in Padova, Italy (2010 - <http://www.tesaf.unipd.it/formec2010/Proceedings/Ab/Ab103.pdf>) and Lisbon, Portugal (2012).

Meet Kent Davis—Our New Research Assistant

Kent Davis started as our new OWIC Undergraduate Student Research Project Coordinator back in late June. As expected, we haven't had any trouble keeping him busy.

Kent's primary role is to coordinate undergraduate student research projects, hence the long, but appropriate, job title! For example, when companies contact us to

request assistance with testing new products, solving product performance challenges, etc., Kent will help develop the proposals and testing protocols, and will then find the right students to get the work done as well as oversee the projects as they are conducted. This position is a significant addition to our capabilities as it will allow us to conduct more projects, of course. However, it will also significantly add to the skill levels of our students – we expect that nearly all of our undergraduate students will have an opportunity to participate in hands-on projects to assist industry; these projects significantly complement what the students learn in their Renewable Materials coursework.

Kent comes to us having spent the last 7 years working as a Research Assistant in another department in the College of Forestry at OSU, where he focused on maintaining remote field sites used to study the exchange of CO₂ between the atmosphere and the forests in the Pacific Northwest. However, he has sawdust in his veins from his



Kent Davis-OWIC Undergraduate Research Project Coordinator

lifelong interest in all things wood and has long sought opportunities to work in the Department of Wood Science & Engineering. With his

background in wooden boatbuilding, instrument building, furniture, and armed with technical and mechanical expertise, and a good knowledge of wood products and properties, he has filled a much needed role. In his spare time, he does

custom woodworking, building and remodeling, and continues to expand his knowledge of the trades.

Some of the projects he has been working on the past couple months have included:

- Wood coating evaluation - assessed the effectiveness of a new coating to reduce the rate of moisture increase for boards used for concrete forms.

- Product mock-ups – built sample wall and floor systems to help an entrepreneur demonstrate his product concept to potential investors.
- Veneer checking – supported a graduate student with a project to assess checking in maple plywood.
- Israeli wood species – researched the literature and developed a table of mechanical and physical properties for common wood species in Israel compared to imported species.
- Website upgrade – updated, reorganized, and expanded the website to facilitate OWIC's mission.
- Safety Program- designed and implements a WSE Department wide safety program for undergraduates.
- Guiding undergraduate students on many small projects related to product testing (bending, screw withdrawal, etc.)

To learn more about Kent visit <http://owic.oregonstate.edu/kent-davis>



Kent Davis advising undergraduate, Ben Gardner, on his research project.

Quality Control in Wood Products Manufacturing Workshop



On November 19th and 20th, the Oregon Wood Innovation Center is offering a workshop on Quality Control in Wood Products Manufacturing. This will be our second offering of this workshop. This course is a mixture of lecture and 'hands on'. The 2 -day session will introduce participants to many of the key tools of quality control – brainstorming, Pareto charts, checksheets, flowcharts, cause-

and-effect diagrams, design of experiments and statistical process control (SPC). And particular emphasis will be given to SPC. Most of the course will be held in a computer lab so that participants have the opportunity to work 'hands-on' to get experience using the tools introduced in the course. Most of the tools will be presented in the context of a case example of a quality problem at a

small, secondary wood products firm – how the firm identified the problem and how they used QC tools to solve the problem as well as to monitor their process over time to ensure the solution was sustained. Space is limited to 28 people – so register early!

For more information, see <http://oregonstate.edu/conferences/event/qualitycontrol2012/>



OSU PROFESSIONAL AND NONCREDIT EDUCATION

Online Courses

Wood-Based Composite Science Short Course Series

This online short course series provides mill operations, technical professionals and suppliers to the wood-based composites industry with a fundamental knowledge of wood as an engineering material.

Register at anytime, or choose to enroll in a cohort with other professionals. The next cohort begins in Jan. 2013.

Register online at pne.oregonstate.edu/wood

Learn more at <http://pne.oregonstate.edu/catalog/wood-based-composite-science-short-course-series>



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Meet Our New Department Head—Laurie Schimleck



Laurence (Laurie) Schimleck started as the new head of the Department of Wood Science & Engineering at OSU on June 1 of this year. Laurie is a native of Australia, where he studied forestry at the University of Melbourne. After his undergraduate studies, he joined the Cooperative Research Center (CRC) for Hardwood Fiber and Paper Science where he completed his PhD investigating rapid, non-destructive techniques for determining the pulp yield of

plantation eucalypts.

Dr. Schimleck then joined the Commonwealth Scientific and Industrial Research Organization (CSIRO), Division of Forestry and Forest Products, where he was a research scientist in the Tree Improvement and Genetic Resources and Pulp and Paper Program's. After six years at CSIRO he moved to the US where he joined the faculty of the Warnell School of Forestry and Natural Resources (WSFNR), at the University of Georgia (UGA). At UGA Dr. Schimleck taught courses in wood anatomy and technology, dendrology and was also involved with local and international (to south east Queensland) study tours. His research focused on the application of near infrared (NIR) spectroscopy for the rapid estimation of wood properties of *Pinus taeda*, examination of the

wood quality of pernambuco (a rare Brazilian wood exclusively used for the manufacture of high quality string instrument bows), monitoring the moisture content variation in wet-stored logs, felled trees and standing trees using time domain reflectometry (TDR) and the examination of silvicultural treatments on the wood properties of *P. taeda*. Dr. Schimleck served as the coordinator of WSNFR's Graduate student program and was the co-director and later director of the Wood Quality Consortium (an industry funded group that investigates the effects of silvicultural activities on wood quality in the USA). Dr. Schimleck is a Fellow of the International Academy of Wood Science, serves as an Associate Editor for the IAWA (International Association of Wood Anatomists) Journal and has served as a member of the Appita Journal Editorial Committee.

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Previous issues of the OWIC newsletter are available at: <http://owic.oregonstate.edu/newsletter/>